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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/826,273

04/19/2004

Osamu Tsuneoka

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02/12/2009

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EXAMINER

TRINH, THANH TRUC

ART UNIT

PAPER NUMBER

1795

NOTIFICATION DATE

DELIVERY MODE

02/12/2009

ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No. 10/826,273	Applicant(s) TSUNEOKA ET AL.	
	Examiner THANH-TRUC TRINH	Art Unit 1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 June 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 9-14 and 16-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 9-14 and 16-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
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| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 1/16/2009 has been entered.

Remark

Claims 9-14 and 16-20 are pending in the application.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.

4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

1. Claims 9-12 and 16-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Brittain et al. (US Patent 5450869) in view of Yang et al. (US Patent Application Publication 2004/0112418)

Regarding claim 9, as seen in Figures 2-6, 15 and 17, Brittain et al. teaches an generation system comprising an combustor (including combustion chamber 36 and burner mantle 39); a high-temperature system line for circulating a thermal medium for receiving heat caused through a combustion process in the combustor (hot combustion gases which flow past hot frame 190 and heat exchanger 60 in compartment 40 and are exhausted through outlet 62 - See col. 4 line 39-55); a low temperature system line (coolant inlet tube 66, troughs 94, outlet tube 68 and the air in heat exchanger – See col. 4 line 55 to col. 5 line 37; claim 1) for circulating a medium on a low-temperature system line for circulating a medium on a low-temperature side which is subjected to heat exchanging with the thermal medium; and an electric generator (thermoelectric generator 38) arranged between the high-temperature system line and the low-temperature system line for recovering the thermal energy of the thermal medium as electric energy, wherein the electric power generated by the electric generator is supplied to a power source including either one of a battery and a power supply element for driving a vehicle equipment (See col. 3 lines 16-32 and col. 8 lines 15-26)

The difference between Brittain et al. and the instant claim is the requirement of the thermoelectric converter composed of a thermoelectric semiconductor which contains, as a major component thereof, a half-Heusler-type compound.

Yang et al. teaches a thermoelectric semiconductor material containing a half-Heusler-type compound. (See Abstract of Yang et al.)

It would have been obvious to one skilled in the art at the time the invention was made to modify the system of Brittain et al. by using the thermoelectric converter composed of a thermoelectric semiconductor material containing a half-Heusler-type compound as taught by Yang et al., because Yang et al. teaches that such material would significantly increase the value of the figure of merit (ZT) by decreasing the structure's thermal conductivity without significant increases to its Seebeck coefficient. (See Abstract of Yang et al.)

Regarding claim 10, Brittain et al. teaches the thermal medium on the high-temperature system line is either one of a combustion gas in a combustion chamber of the combustor and an exhaust gas discharged from the combustion chamber (See col. 8 lines 1-27). Brittain et al. also teaches blowing air over the [heated] liquid coolant to heat the air (See claim 1) and the air is either from inside or outside a vehicle, therefore it is the Examiner's position that one of the low-temperature side medium is either one of an air outside a vehicle and an air inside the vehicle.

Regarding claims 11-12, Brittain et al. teaches the thermal medium on the high-temperature system line is either one of a combustion gas in a combustion chamber of the combustor and an exhaust gas discharged from the combustion chamber (See col. 8 lines 1-27), and the low-temperature side medium is a water circulated from either one of a radiator and a heating system (See col. 4 lines 55-60).

Regarding claim 16, as seen in Figures 5a-b, Brittain et al. teaches the thermoelectric converter constitutes a generation module (or thermoelectric element 114 – See col. 5 line 38 to col. 6 line 53).

Regarding claim 17, as seen in Figures 2-5, 15 and 17, Brittain et al. teaches the combustor (including combustion chamber 36 and burner mantle 39) has a cylindrical combustor casing (hot frame 190) and at least one of the generation modules (or thermoelectric element 114 of the thermoelectric generator 38) is mounted to an outer peripheral surface of the combustor casing.

Regarding claim 18, Brittain et al. teaches the combustor (including combustion chamber 36 and burner mantle 39) has a cylindrical combustor casing (housing 32) and at least one of the generation modules (or thermoelectric element 114 of thermoelectric generator 38) is mounted to an inner peripheral surface of the combustor casing.

2. Claims 13-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Brittain et al. in view of Yang et al. and further in view of Davies et al. (EP 0585047).

Regarding claim 13, Brittain et al. in view of Yang et al. teaches a generation system as applied to claims 9-12 and 16-18 above.

Brittain et al. in view of Yang et al. does not teach an exhaust gas cleanup device arranged in an exhaust gas line extending from the combustor, wherein the exhaust gas cleanup device including a discharge reactor for generating chemically active species by carrying out a discharging process to the exhaust gas and a catalyst reactor having a catalyst activated by the chemically active species generated in the discharge reactor.

Davies et al. teaches a cleanup device including a plasma treatment (or low-temperature electrical discharge) prior to passing the exhaust emission through the catalytic converter (See whole document), wherein the plasma treatment creates ionized species, electrons and free radicals that are very active (See col. 2 lines 15-23). Therefore it is the Examiner's position that Davies et al. teaches an exhaust gas cleanup device including a discharge reactor (or plasma treatment) for generating chemically active species (or ionized species, electrons and free radicals) by carrying out a discharging process to the exhaust gas and a catalyst reactor (or catalytic converter).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the generation system of Brittain et al. in view of Yang et al. by adding an exhaust gas cleanup device as taught by Davies et al., because Davies et al. teaches it would reduce exhaust gas pollutants. (See Abstract or col. 1 lines 1-21 of Davies et al.)

In addition, Davies et al teaches treating exhaust gas, therefore it would have been obvious to arrange the exhaust gas clean up device in an exhaust gas line extending from the combustor.

Regarding claim 14, Brittain et al. teaches the electric generator supplies power to the power source of the battery of the generation system and the power supply element for driving a vehicle equipment. ((See col. 3 lines 16-32 and col. 8 lines 15-26)

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3. Claims 19-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Brittain et al. in view of Yang et al. and further in view of Miyauchi et al. (US Patent 6800963).

Brittain et al. in view of Yang et al. teaches a generation system as applied to claims 9-12 and 16-18 above.

Brittain et al. in view of Yang et al. does not teach the generation system further comprising either one of a voltage step-up unit and a voltage step-down unit for adjusting the generating power to a load during use, nor do they teach a voltage detecting circuit for automatically detecting and discriminating the generation of voltage, wherein the voltage detecting circuit controlling a power supply by making or breaking an electric line supplying power from the electric generator to a load.

With respect to claim 19, Miyauchi et al. teaches a generation system using thermoelectric generator (See col. 12 lines 21-42), wherein the generation system comprises a voltage step-up or step-down unit (control means 15) for adjusting the generating power to a load during use. (See Figure 6, col. 10 line 63 to col. 12 line 13)

With respect to claim 20, Miyauchi et al. also teaches a voltage detecting circuit (including voltage detection means 23 and diode 14) for automatically detecting, discriminating the generation of voltage and controlling a power supply by making a breaking an electric line supplying power from the electric generator to a load. (See Figure 6, col. 10 line 63 to col. 12 line 13)

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the generation system of Brittain et al. in view of Yang et

al. by incorporating a voltage step-up or step-down unit and a voltage detecting circuit as taught by Miyauchi et al., because Miyauchi et al. teaches that, by using the voltage step-up, the voltage step-down and the voltage detecting circuit (or output controller) for the generation system (either fuel cell or other power generation means such as thermoelectric), the power generation system is more efficient and reliable. (See col. 2 lines 27-33 or col. 12 line 43-47)

Response to Arguments

Applicant's arguments with respect to claims 9-14 and 16-20 have been considered but are moot in view of the new ground(s) of rejection.

Applicant argues that Brittain fails to describe the thermal medium on the high-temperature line is an exhaust gas subsequent to the combustion process as recited in claim 12. However, the Examiner respectfully disagrees. Brittain et al. clearly teaches the thermal medium of combustion gas (or hot air) on the high-temperature system line is clearly an exhaust gas subsequent to the combustion process (See col. 8 lines 1-27 of Brittain et al.)

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to THANH-TRUC TRINH whose telephone number is (571)272-6594. The examiner can normally be reached on 8:30 am - 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam Nguyen can be reached on 571-272-1342. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Nam X Nguyen/
Supervisory Patent Examiner, Art Unit 1753

TT
02/08/2009